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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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NTT Mobile Communications Network I/BHGL
P.O. Box 10395
Chicago, IL 60610

EXAMINER	
ZEILBERGER, DANIEL	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/670,698	BOSSEN, FRANK JAN
	Examiner	Art Unit
	DANIEL ZEILBERGER	2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

This office action is in reply to the applicant's response dated 07/17/2008.

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Section IV.C, reads as follows:

> While abstract ideas, natural phenomena, and laws of nature are not eligible for patenting, methods and products employing abstract ideas, natural phenomena, and laws of nature to perform a real-world function may well be. In evaluating whether a claim meets the requirements of section 101, the claim must be considered as a whole to determine whether it is for a particular application of an abstract idea, natural phenomenon, or law of nature, rather than for the abstract idea, natural phenomenon, or law of nature itself.
>
> For claims including such excluded subject matter to be eligible, the claim must be for a practical application of the abstract idea, law of nature, or natural phenomenon. Diehr, 450 U.S. at 187, 209 USPQ at 8 ("application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection."); Benson, 409 U.S. at 71, 175 USPQ at 676 (rejecting formula claim because it "has no substantial practical application").
>
> To satisfy section 101 requirements, the claim must be for a practical application of the Sec. 101 judicial exception, which can be identified in various ways:
>
> > The claimed invention "transforms" an article or physical object to a different state or thing.
> >
> > The claimed invention otherwise produces a useful, concrete and tangible result, based on the factors discussed below.

Claims 1-45 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 1-45 recite the mere manipulation of data or an abstract idea, or merely solve a mathematical problem without a limitation to a practical application. A practical application exists if the <u>*result*</u> of the claimed invention is "useful, concrete and tangible" (with the emphasis on

"result")(Guidelines, section IV.C.2.b). A "useful" result is one that satisfies the utility requirement of section 101, a "concrete" result is one that is "repeatable" or "predictable", and a "tangible" result is one that is "real", or "real-world", as opposed to "abstract" (Guidelines, section IV.C.2.b)). Claims 1-29, 31-44 merely manipulate data without ever producing a useful, concrete and tangible result. Specifically, claims 1-29, 31-44 merely manipulate a block of coefficients, and are thus merely reciting the manipulation of data. Claims 30 and 45 also merely manipulate a block of coefficients, and are thus merely reciting the manipulation of data (In re Alappat, 33 F.3d 1526, 1545, 31 USPQ2d 1556-1559 (Fed. Cir. 1994) (en banc)).

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.
>
> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).
>
> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

Claims 13-24 and 37-40 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 13-24 and 37-40 define a decoder embodying functional descriptive material. However, the claims do not define a computer-readable medium or computer-readable memory and are thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). The scope of the presently claimed invention encompasses products that are not necessarily computer readable, and thus NOT able to impart any functionality of the recited program. The examiner suggests amending the claim(s) to embody the program on "computer-readable medium" or equivalent; assuming the specification does NOT define the computer readable medium as a "signal", "carrier wave", or "transmission medium" which are deemed non-statutory (refer to "note" below). Any amendment to the claim should be commensurate with its corresponding disclosure.

Note:

"A transitory, propagating signal … is not a "process, machine, manufacture, or composition of matter." Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter." (*In re Petrus A.C.M. Nuijten;* Fed Cir, 2006-1371, 9/20/2007).

Should the full scope of the claim as properly read in light of the disclosure encompass non-statutory subject matter such as a "signal", the claim as a whole would be non-statutory. In the case where the specification defines the computer readable medium or memory as statutory tangible products such as a hard drive, ROM, RAM, etc, as well as a non-statutory entity such as a "signal", "carrier wave", or "transmission medium", the examiner suggests amending the claim to *include* the disclosed tangible computer readable media, while at the same time *excluding* the intangible media such as signals, carrier waves, etc.

However, even given this suggestion, the claim would continue to be non-statutory for the reasons above.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. *Claims 1-9, 12-21, and 24* are rejected under 35 U.S.C. 102(a) as being anticipated by Wiegand ("Joint Committee Draft (CD)").

Regarding **claim 1**, Wiegand discloses a decoding process (see section 14.3, wherein a scaling and inverse transform for ABT blocks is disclosed), comprising:

scaling a block of coefficients that represents a block of information using a scaling factor determined for each coefficient by computing an index for said each

coefficient and indexing a look-up table (LUT) using the index (see section 14.3.2.2, wherein equation 14-3 is used to scale an MxN block of coefficients, wherein a coefficient YQ(i,j) is scaled by R(QP%6, i, j), such that for each scaling operation, in order to determine R(QP%6, i, j), index parameters i, j, QP, and block size are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4),

wherein the index is based on a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block (see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), QP, block size, and coefficient position i, j are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4);

applying a transform to the block of scaled coefficients in order to decode the block of information (see section 14.3.2, wherein as shown in section 14.3.2.2 the matrix of scaled coefficients YD(i,j) are inverse transformed first horizontally and then vertically to obtain a final decoded result S'(I,j));

wherein the LUT is used independently of the block size, such that the LUT supports the transform being for one of a plurality of block sizes (see table 14-1, wherein the same lookup table 14-1 is used regardless of whether mode 8x8, 8x4, 4x8, or 4x4 is used, and further wherein the same S table $S_{8x4,4x8}$ is used within the lookup table 14-1 for both mode 4x8 and mode 8x4).

Regarding **claim 2**, Wiegand further discloses:

wherein the index is the sum of the quantization parameter and a first value determined by block size of the block of coefficients and the position of said each coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum) of the quantization parameter (QP), the block size (i.e. 8x8, 8x4, 4x8, or 4x4), and the position of the coefficient (i.e. (i, j)), are required).

Regarding **claim 3**, Wiegand further discloses:

wherein the first value is the sum of a second value determined by the vertical size of the block and the vertical position of said each coefficient within the block and a third value determined by the horizontal size of the block and the horizontal position of said each coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum) of the block size (i.e. 8x8, 8x4, 4x8, or 4x4), and the position of the coefficient (i.e. (i, j)), are required, wherein as evidenced by differing modes 4x8 and 8x4, not only does the actual block size affect the indexing but also specifically the vertical size and the horizontal size, and further wherein coordinates i and j refer to the coefficients vertical and horizontal position within the block).

Regarding **claim 4**, Wiegand further discloses:

wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8 (see section 14.3.2.2, wherein modes 8x8, 8x4, 4x8, and 4x4 are disclosed).

Regarding **claim 6**, Wiegand further discloses:

determining an offset of an array according to the position of said each coefficient; determining an inverse quantization value for said each coefficient based on the offset (see section 14.3.2.2 and equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, and 4x4, wherein according to the coefficient position, a particular column of a particular S table of the table 14-1 is selected, wherein the output of the table 14-1 determines the inverse quantization value for the coefficient).

Regarding **claim 7**, Wiegand further discloses:

wherein entries of the array are of a form pow(2, (k+O)/12), where k represents a position of an individual entry in the array and O is a constant (see table 14-1, wherein all of the values in the table 14-1 can be represented by the form pow(2, x), since any number can be represented by pow(2, x), and thus an appropriate k value will exist for any number such that the number will equal pow(2, (k+O)/12), and further since each column is increasing as the position increases, k will be increasing as the position increases and thus will represent the position of an individual entry, such as for the first column wherein a selection of O=47.3 would result in k values equal to 0, 2, 4, 6, 8, and 10, in order to achieve the exhibited values).

Regarding **claim 8**, Wiegand further discloses:

wherein the array is a 1-dimensional (I-D) (see section 14.3.2.2, table 14-1, wherein in the mode 8x8, S_{8x8} is 1-dimensional).

Regarding **claim 9**, Wiegand further discloses:

wherein applying a transform to the block of scaled coefficients comprises: applying a vertical transform to the block of scaled coefficients; and applying a horizontal transform to block of scaled coefficients (see section 14.3.2.2, wherein a horizontal transform is applied in equation 14-4, and a vertical transform is then applied in equation 14-6).

Regarding **claim 12**, Wiegand further discloses:

wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8 (see section 14.3.2.2, wherein modes 8x8, 8x4, 4x8, and 4x4 are disclosed).

Regarding **claim 13**, Wiegand discloses a computer-implemented decoder (see section 14.3, wherein a scaling and inverse transform for ABT blocks is disclosed) comprising:

a look-up table (LUT) (see table 14-1);

an inverse quantizer to scale a block of coefficients that represents a block of information using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing the LUT using the index (see section 14.3.2.2, wherein equation 14-3 is used to scale an MxN block of coefficients, wherein a

coefficient YQ(i,j) is scaled by R(QP%6, i, j), such that for each scaling operation, in order to determine R(QP%6, i, j), index parameters i, j, QP, and block size are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4),

wherein the index is based on a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block (see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), QP, block size, and coefficient position i, j are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4);

an inverse transform unit to applying a transform to the block of scaled coefficients in order to decode the block of information (see section 14.3.2, wherein as shown in section 14.3.2.2 the matrix of scaled coefficients YD(i,j) are inverse transformed first horizontally and then vertically to obtain a final decoded result S'(I,j));

wherein the LUT is used independently of the block size, such that the LUT supports the transform being for one of a plurality of block sizes (see table 14-1, wherein the same lookup table 14-1 is used regardless of whether mode 8x8, 8x4, 4x8, or 4x4 is used, and further wherein the same S table $S_{8x4,4x8}$ is used within the lookup table 14-1 for both mode 4x8 and mode 8x4).

Regarding **claim 14**, Wiegand further discloses:

wherein the index is the sum of the quantization parameter and a first value determined by block size of the block of coefficients and the position of said each

coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum) of the quantization parameter (QP), the block size (i.e. 8x8, 8x4, 4x8, or 4x4), and the position of the coefficient (i.e. (i, j)), are required).

Regarding **claim 15**, Wiegand further discloses:

wherein the first value is the sum of a second value determined by the vertical size of the block and the vertical position of said each coefficient within the block and a third value determined by the horizontal size of the block and the horizontal position of said each coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum) of the block size (i.e. 8x8, 8x4, 4x8, or 4x4), and the position of the coefficient (i.e. (i, j)), are required, wherein as evidenced by differing modes 4x8 and 8x4, not only does the actual block size affect the indexing but also specifically the vertical size and the horizontal size, and further wherein coordinates i and j refer to the coefficients vertical and horizontal position within the block).

Regarding **claim 16**, Wiegand further discloses:

wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8 (see section 14.3.2.2, wherein modes 8x8, 8x4, 4x8, and 4x4 are disclosed).

Regarding **claim 18**, Wiegand further discloses:

wherein the inverse quantizer scales a block of coefficients using a scaling factor by determining an offset of an array according to the position of said each coefficient; determining an inverse quantization value for said each coefficient based on the offset (see section 14.3.2.2 and equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, and 4x4, wherein according to the coefficient position, a particular column of a particular S table of the table 14-1 is selected, wherein the output of the table 14-1 determines the inverse quantization value for the coefficient).

Regarding **claim 19**, Wiegand further discloses:

wherein entries of the array are of a form pow(2, (k+O)/12), where k represents a position of an individual entry in the array and O is a constant (see table 14-1, wherein all of the values in the table 14-1 can be represented by the form pow(2, x), since any number can be represented by pow(2, x), and thus an appropriate k value will exist for any number such that the number will equal pow(2, (k+O)/12), and further since each column is increasing as the position increases, k will be increasing as the position increases and thus will represent the position of an individual entry, such as for the first column wherein a selection of O=47.3 would result in k values equal to 0, 2, 4, 6, 8, and 10, in order to achieve the exhibited values).

Regarding **claim 20**, Wiegand further discloses:

wherein the array is a 1-dimensional (I-D) (see section 14.3.2.2, table 14-1, wherein in the mode 8x8, S_{8x8} is 1-dimensional).

Regarding **claim 21**, Wiegand further discloses:

wherein the transform unit applies the transform to the block of scaled coefficients by applying a vertical transform to the block of scaled coefficients; and applying a horizontal transform to block of scaled coefficients (see section 14.3.2.2, wherein a horizontal transform is applied in equation 14-4, and a vertical transform is then applied in equation 14-6).

Regarding **claim 24**, Wiegand further discloses:

wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8 (see section 14.3.2.2, wherein modes 8x8, 8x4, 4x8, and 4x4 are disclosed).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. *Claims 25-30* are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiegand in view of Boon et al. (US Patent 6,574,368), hereinafter referenced as Boon.

Regarding **claim 25**, Wiegand discloses to:

scale a block of coefficients that represents a block of information using a scaling factor determined for each coefficient by computing an index for said each coefficient

and indexing a look-up table (LUT) using the index (see section 14.3.2.2, wherein equation 14-3 is used to scale an MxN block of coefficients, wherein a coefficient YQ(i,j) is scaled by R(QP%6, i, j), such that for each scaling operation, in order to determine R(QP%6, i, j), index parameters i, j, QP, and block size are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4),

wherein the index is based on a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block (see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), QP, block size, and coefficient position i, j are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4);

apply a transform to the block of scaled coefficients in order to decode the block of information (see section 14.3.2, wherein as shown in section 14.3.2.2 the matrix of scaled coefficients YD(i,j) are inverse transformed first horizontally and then vertically to obtain a final decoded result S'(I,j));

wherein the LUT is used independently of the block size, such that the LUT supports the transform being for one of a plurality of block sizes (see table 14-1, wherein the same lookup table 14-1 is used regardless of whether mode 8x8, 8x4, 4x8, or 4x4 is used, and further wherein the same S table $S_{8x4,4x8}$ is used within the lookup table 14-1 for both mode 4x8 and mode 8x4).

Wiegand fails to expressly disclose implementing the above steps such that an article of manufacture comprising one or more computer-readable medium storing instructions which, when executed by a system, cause the system to perform the steps.

However, the examiner maintains that it would have been obvious, in view of Boon, to provide:

an article of manufacture comprising one or more computer-readable medium storing instructions which, when executed by a system, cause the system to perform the above recited steps (see Boon column 29 lines 48-54).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing "an article of manufacture comprising one or more computer-readable medium storing instructions which, when executed by a system, cause the system to" perform the above recited steps, as taught by Boon, for the purpose of ensuring a high computational speed, the capability of program algorithm modification without changing hardware, and to provide the ability for the decoding algorithm to be disseminated and used by the millions of people who have access to computers.

Regarding **claim 26**, Wiegand further discloses:

wherein the index is the sum of the quantization parameter and a first value determined by block size of the block of coefficients and the position of said each coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum) of the quantization parameter (QP), the block size (i.e. 8x8, 8x4, 4x8, or 4x4), and the position of the coefficient (i.e. (i, j)), are required).

Regarding **claim 27**, Wiegand further discloses:

wherein the first value is the sum of a second value determined by the vertical size of the block and the vertical position of said each coefficient within the block and a third value determined by the horizontal size of the block and the horizontal position of said each coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum) of the block size (i.e. 8x8, 8x4, 4x8, or 4x4), and the position of the coefficient (i.e. (i, j)), are required, wherein as evidenced by differing modes 4x8 and 8x4, not only does the actual block size affect the indexing but also specifically the vertical size and the horizontal size, and further wherein coordinates i and j refer to the coefficients vertical and horizontal position within the block).

Regarding **claim 28**, Wiegand further discloses:

wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8 (see section 14.3.2.2, wherein modes 8x8, 8x4, 4x8, and 4x4 are disclosed).

Regarding **claim 30**, Wiegand discloses to:

scale a block of coefficients that represents a block of information using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index (see section 14.3.2.2, wherein equation 14-3 is used to scale an MxN block of coefficients, wherein a coefficient YQ(i,j) is scaled by R(QP%6, i, j), such that for each scaling operation, in order to determine

R(QP%6, i, j), index parameters i, j, QP, and block size are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4),

wherein the index is based on a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block (see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), QP, block size, and coefficient position i, j are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4);

apply a transform to the block of scaled coefficients in order to decode the block of information (see section 14.3.2, wherein as shown in section 14.3.2.2 the matrix of scaled coefficients YD(i,j) are inverse transformed first horizontally and then vertically to obtain a final decoded result S'(I,j));

wherein the LUT is used independently of the block size, such that the LUT supports the transform being for one of a plurality of block sizes (see table 14-1, wherein the same lookup table 14-1 is used regardless of whether mode 8x8, 8x4, 4x8, or 4x4 is used, and further wherein the same S table $S_{8x4,4x8}$ is used within the lookup table 14-1 for both mode 4x8 and mode 8x4).

Wiegand fails to expressly disclose implementing the above steps using a decoding apparatus comprising the "means for" scaling and the "means for" applying a transform. However, the examiner maintains that it would have been obvious, in view of Boon, to provide:

decoding apparatus comprising the "means for" scaling and the "means for" applying a transform (see Boon column 29 lines 48-54).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing a decoding apparatus comprising the "means for" scaling and the "means for" applying a transform, as taught by Boon, for the purpose of ensuring a high computational speed, the capability of program algorithm modification without changing hardware, and to provide the ability for the decoding algorithm to be disseminated and used by the millions of people who have access to computers.

6. *Claims 10, 11, 22, 23, 31-40* are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiegand in view of Ohki (US Patent 5,519,503), hereinafter referenced as Ohki.

Regarding **claims 10, 22**, Wiegand discloses everything as applied above in regards to claim 1. Wiegand fails to disclose "wherein the basis vectors of the transform are:

$$\begin{matrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 12/8 & 10/8 & 6/8 & 3/8 & -3/8 & -6/8 & -10/8 & -12/8 \\ 1 & 1/2 & -1/2 & -1 & -1 & -1/2 & 1/2 & 1 \\ 10/8 & -3/8 & -12/8 & -6/8 & 6/8 & 12/8 & 3/8 & -10/8 \\ 1 & -1 & -1 & 1 & 1 & -1 & -1 & 1 \\ 6/8 & -12/8 & 3/8 & 10/8 & -10/8 & -3/8 & 12/8 & -6/8 \\ 1/2 & -1 & 1 & -1/2 & -1/2 & 1 & -1 & 1/2 \\ 3/8 & -6/8 & 10/8 & -12/8 & 12/8 & -10/8 & 6/8 & -3/8. \end{matrix}$$

and represent an 8-point transform used for blocks that have one or both of horizontal and vertical size of 8".

However, the examiner maintains that it would have been obvious, as taught by Ohki, to provide:

wherein the basis vectors of the transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8.

and represent an 8-point transform used for blocks that have one or both of horizontal and vertical size of 8 (see column 7 line 59 through column 8 line 27 and column 9 lines 4-17, wherein an 8x8 near-linear IDCT is disclosed such that, factoring out a multiple of ½, the disclosed inverse transform coefficients are nearly the same as those in the claimed invention. While the examiner concedes that the blocks of coefficients are not identical, the examiner maintains that since both matrices are approximations of an IDCT applied to an 8x8 block of coefficients, one of ordinary skill in the art would recognize that the differences amount to different choices of rounding from the original irrational numbers and are thus merely a design choice. The examiner will reconsider, if applicant amends the claim to include some advantage over the prior art).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing “wherein the basis vectors of the transform are:

$$\begin{matrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 12/8 & 10/8 & 6/8 & 3/8 & -3/8 & -6/8 & -10/8 & -12/8 \\ 1 & 1/2 & -1/2 & -1 & -1 & -1/2 & 1/2 & 1 \\ 10/8 & -3/8 & -12/8 & -6/8 & 6/8 & 12/8 & 3/8 & -10/8 \\ 1 & -1 & -1 & 1 & 1 & -1 & -1 & 1 \\ 6/8 & -12/8 & 3/8 & 10/8 & -10/8 & -3/8 & 12/8 & -6/8 \\ 1/2 & -1 & 1 & -1/2 & -1/2 & 1 & -1 & 1/2 \\ 3/8 & -6/8 & 10/8 & -12/8 & 12/8 & -10/8 & 6/8 & -3/8, \end{matrix}$$

and represent an 8-point transform used for blocks that have one or both of horizontal and vertical size of 8”, as taught by Ohki, for the purpose of performing an IDCT processing without employing multiplication circuits, resulting in a simpler circuit (see Ohki column 9 lines 4-17).

Regarding **claims 11, 23**, Wiegand discloses everything as applied above in regards to claim 1. Wiegand fails to disclose “wherein applying the transform to the block of scaled coefficients comprises computing the transform using only a sequence of addition, subtraction, and shift operations”. However, the examiner maintains that it would have been obvious, in view of Ohki, to provide:

wherein applying the transform to the block of scaled coefficients comprises computing the transform using only a sequence of addition, subtraction, and shift operations (see column 9 lines 4-17, wherein a transform is disclosed that makes use of only addition and subtraction circuits, without employing multiplication circuits, such that the circuit scale may be simplified).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing "wherein applying the transform to the block of scaled coefficients comprises

computing the transform using only a sequence of addition, subtraction, and shift operations", as taught by Ohki, for the purpose of simplifying the circuit scale.

Regarding **claim 31**, Wiegand discloses a decoding process (see section 14.3, wherein a scaling and inverse transform for ABT blocks is disclosed), comprising:

scaling a block of coefficients that represents a block of information using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index (see section 14.3.2.2, wherein equation 14-3 is used to scale an MxN block of coefficients, wherein a coefficient YQ(i,j) is scaled by R(QP%6, i, j), such that for each scaling operation, in order to determine R(QP%6, i, j), index parameters i, j, QP, and block size are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4),

wherein the index is based on a quantization parameter, and a position of said each coefficient within the block (see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), QP, block size, and coefficient position i, j are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4);

applying a vertical transform and a horizontal transform to the block of scaled coefficients in order to decode the block of information (see section 14.3.2, wherein as shown in section 14.3.2.2 the matrix of scaled coefficients YD(i,j) are inverse transformed first horizontally and then vertically to obtain a final decoded result S'(I,j));

wherein the LUT is used independently of the block size, such that the LUT supports the transform being for one of a plurality of block sizes (see table 14-1, wherein the same lookup table 14-1 is used regardless of whether mode 8x8, 8x4, 4x8, or 4x4 is used, and further wherein the same S table $S_{8x4,4x8}$ is used within the lookup table 14-1 for both mode 4x8 and mode 8x4).

Wiegand fails to disclose "wherein the basis vectors of the vertical and horizontal transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8.

or multiples thereof.

However, the examiner maintains that it would have been obvious, as taught by Ohki, to provide:

wherein the basis vectors of the vertical and horizontal transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8.

or multiples thereof. (see column 7 line 59 through column 8 line 27 and column 9 lines 4-17, wherein an 8x8 near-linear IDCT is disclosed such that,

factoring out a multiple of ½, the disclosed inverse transform coefficients are nearly the same as those in the claimed invention. While the examiner concedes that the blocks of coefficients are not identical, the examiner maintains that since both matrices are approximations of an IDCT applied to an 8x8 block of coefficients, one of ordinary skill in the art would recognize that the differences amount to different choices of rounding from the original irrational numbers and are thus merely a design choice. The examiner will reconsider, if applicant amends the claim to include some advantage over the prior art).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing "wherein the basis vectors of the vertical and horizontal transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8,

or multiples thereof.

", as taught by Ohki, for the purpose of performing an IDCT processing without employing multiplication circuits, resulting in a simpler circuit (see Ohki column 9 lines 4-17).

Regarding **claim 32**, Wiegand further discloses:

wherein the index is a sum of the quantization parameter a first value determined by a vertical position of said each coefficient within the block and a second value

determined by a horizontal position of said each coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum) of the quantization parameter (QP), and the position of the coefficient (i, j), are required, wherein coordinates i and j refer to the coefficients vertical and horizontal position within the block).

Regarding **claim 33**, Wiegand discloses everything as applied above in regards to claim 1. Wiegand fails to disclose "wherein applying the transform comprises computing the transform using only a sequence of addition, subtraction, and shift operations". However, the examiner maintains that it would have been obvious, in view of Ohki, to provide:

wherein applying the transform comprises computing the transform using only a sequence of addition, subtraction, and shift operations (see column 9 lines 4-17, wherein a transform is disclosed that makes use of only addition and subtraction circuits, without employing multiplication circuits, such that the circuit scale may be simplified).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing "wherein applying the transform comprises computing the transform using only a sequence of addition, subtraction, and shift operations", as taught by Ohki, for the purpose of simplifying the circuit scale.

Regarding **claim 34**, Wiegand further discloses:

wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8 (see section 14.3.2.2, wherein modes 8x8, 8x4, 4x8, and 4x4 are disclosed).

Regarding **claim 36**, Wiegand further discloses:

wherein applying a transform to the block of scaled coefficients comprises: applying a vertical transform to the block of scaled coefficients; and applying a horizontal transform to block of scaled coefficients (see section 14.3.2.2, wherein a horizontal transform is applied in equation 14-4, and a vertical transform is then applied in equation 14-6).

Regarding **claim 37**, Wiegand discloses a computer-implemented decoder (see section 14.3, wherein a scaling and inverse transform for ABT blocks is disclosed) comprising:

an inverse quantizer to scale a block of coefficients that represents a block of information using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index (see section 14.3.2.2, wherein equation 14-3 is used to scale an MxN block of coefficients, wherein a coefficient YQ(i,j) is scaled by R(QP%6, i, j), such that for each scaling operation, in order to determine R(QP%6, i, j), index parameters i, j, QP, and block size are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4),

wherein the index is based on a quantization parameter and a position of said each coefficient within the block (see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), QP, block size, and coefficient position i, j are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4);

an inverse transform to apply a vertical transform and a horizontal transform to the block of scaled coefficients in order to decode the block of information (see section 14.3.2, wherein as shown in section 14.3.2.2 the matrix of scaled coefficients YD(i,j) are inverse transformed first horizontally and then vertically to obtain a final decoded result S'(I,j));

wherein the LUT is used independently of the block size, such that the LUT supports the transform being for one of a plurality of block sizes (see table 14-1, wherein the same lookup table 14-1 is used regardless of whether mode 8x8, 8x4, 4x8, or 4x4 is used, and further wherein the same S table $S_{8x4,4x8}$ is used within the lookup table 14-1 for both mode 4x8 and mode 8x4).

Wiegand fails to disclose "wherein the basis vectors of the vertical and horizontal transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8.

or multiples thereof.

However, the examiner maintains that it would have been obvious, as taught by Ohki, to provide:

wherein the basis vectors of the vertical and horizontal transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8,

or multiples thereof. (see column 7 line 59 through column 8 line 27 and column 9 lines 4-17, wherein an 8x8 near-linear IDCT is disclosed such that, factoring out a multiple of ½, the disclosed inverse transform coefficients are nearly the same as those in the claimed invention. While the examiner concedes that the blocks of coefficients are not identical, the examiner maintains that since both matrices are approximations of an IDCT applied to an 8x8 block of coefficients, one of ordinary skill in the art would recognize that the differences amount to different choices of rounding from the original irrational numbers and are thus merely a design choice. The examiner will reconsider, if applicant amends the claim to include some advantage over the prior art).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing "wherein the basis vectors of the vertical and horizontal transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8,

or multiples thereof. ", as taught by Ohki, for the purpose of performing an IDCT processing without employing multiplication circuits, resulting in a simpler circuit (see Ohki column 9 lines 4-17).

Regarding **claim 38**, Wiegand further discloses:

wherein the index is a sum of the quantization parameter a first value determined by a vertical position of said each coefficient within the block and a second value determined by a horizontal position of said each coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum) of the quantization parameter (QP), and the position of the coefficient (i, j), are required, wherein coordinates i and j refer to the coefficients vertical and horizontal position within the block).

Regarding **claim 39**, Wiegand discloses everything as applied above in regards to claim 1. Wiegand fails to disclose "wherein applying the transform comprises computing the transform using only a sequence of addition, subtraction, and shift operations". However, the examiner maintains that it would have been obvious, in view of Ohki, to provide:

wherein applying the transform comprises computing the transform using only a sequence of addition, subtraction, and shift operations (see column 9 lines 4-17, wherein a transform is disclosed that makes use of only addition and subtraction circuits, without employing multiplication circuits, such that the circuit scale may be simplified).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing "wherein applying the transform comprises computing the transform using only a sequence of addition, subtraction, and shift operations", as taught by Ohki, for the purpose of simplifying the circuit scale.

Regarding **claim 40**, Wiegand further discloses:

wherein applying a transform to the block of scaled coefficients comprises: applying a vertical transform to the block of scaled coefficients; and applying a horizontal transform to block of scaled coefficients (see section 14.3.2.2, wherein a horizontal transform is applied in equation 14-4, and a vertical transform is then applied in equation 14-6).

7. *Claims 41-45* are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiegand in view of Boon, and further in view of Ohki.

Regarding **claim 41**, Wiegand discloses to:

scale a block of coefficients that represents a block of information using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index (see section 14.3.2.2, wherein equation 14-3 is used to scale an MxN block of coefficients, wherein a coefficient YQ(i,j) is scaled by R(QP%6, i, j), such that for each scaling operation, in order to determine R(QP%6, i, j), index parameters i, j, QP, and block size are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4),

wherein the index is based on a quantization parameter and a position of said each coefficient within the block (see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), QP, block size, and coefficient position i, j are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4);

apply a vertical transform and a horizontal transform to the block of scaled coefficients in order to decode the block of information (see section 14.3.2, wherein as shown in section 14.3.2.2 the matrix of scaled coefficients YD(i,j) are inverse transformed first horizontally and then vertically to obtain a final decoded result S'(I,j));

wherein the LUT is used independently of the block size, such that the LUT supports the transform being for one of a plurality of block sizes (see table 14-1, wherein the same lookup table 14-1 is used regardless of whether mode 8x8, 8x4, 4x8, or 4x4 is used, and further wherein the same S table $S_{8x4,4x8}$ is used within the lookup table 14-1 for both mode 4x8 and mode 8x4).

Wiegand fails to disclose "wherein the basis vectors of the vertical and horizontal transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8,

or multiples thereof

However, the examiner maintains that it would have been obvious, as taught by Ohki, to provide:

wherein the basis vectors of the vertical and horizontal transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8,

or multiples thereof. (see column 7 line 59 through column 8 line 27 and column 9 lines 4-17, wherein an 8x8 near-linear IDCT is disclosed such that, factoring out a multiple of ½, the disclosed inverse transform coefficients are nearly the same as those in the claimed invention. While the examiner concedes that the blocks of coefficients are not identical, the examiner maintains that since both matrices are approximations of an IDCT applied to an 8x8 block of coefficients, one of ordinary skill in the art would recognize that the differences amount to different choices of rounding

from the original irrational numbers and are thus merely a design choice. The examiner will reconsider, if applicant amends the claim to include some advantage over the prior art).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing “wherein the basis vectors of the vertical and horizontal transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8.

or multiples thereof. ”, as taught by Ohki, for the purpose of performing an IDCT processing without employing multiplication circuits, resulting in a simpler circuit (see Ohki column 9 lines 4-17).

In addition, Wiegand fails to expressly disclose implementing the above steps such that an article of manufacture comprising one or more computer-readable medium storing instructions which, when executed by a system, cause the system to perform the steps. However, the examiner maintains that it would have been obvious, in view of Boon, to provide:

an article of manufacture comprising one or more computer-readable medium storing instructions which, when executed by a system, cause the system to perform the above recited steps (see Boon column 29 lines 48-54).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing “an article of manufacture comprising one or more computer-readable medium storing instructions which, when executed by a system, cause the system to” perform the above recited steps, as taught by Boon, for the purpose of ensuring a high computational speed, the capability of program algorithm modification without changing hardware, and to provide the ability for the decoding algorithm to be disseminated and used by the millions of people who have access to computers.

Regarding **claim 42**, Wiegand further discloses:

wherein the index is a sum of the quantization parameter a first value determined by a vertical position of said each coefficient within the block and a second value determined by a horizontal position of said each coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum) of the quantization parameter (QP), and the position of the coefficient (i, j), are required, wherein coordinates i and j refer to the coefficients vertical and horizontal position within the block).

Regarding **claim 43**, Wiegand discloses everything as applied above in regards to claim 1. Wiegand fails to disclose “wherein instructions to cause the system to apply the transform comprise instructions which, when executed by the system, cause the system to computer the transform using only a sequence of addition, subtraction, and

shift operations". However, the examiner maintains that it would have been obvious, in view of Ohki, to provide:

wherein instructions to cause the system to apply the transform comprise instructions which, when executed by the system, cause the system to computer the transform using only a sequence of addition, subtraction, and shift operations (see column 9 lines 4-17, wherein a transform is disclosed that makes use of only addition and subtraction circuits, without employing multiplication circuits, such that the circuit scale may be simplified).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing "wherein instructions to cause the system to apply the transform comprise instructions which, when executed by the system, cause the system to computer the transform using only a sequence of addition, subtraction, and shift operations", as taught by Ohki, for the purpose of simplifying the circuit scale.

Regarding **claim 44**, Wiegand further discloses:

apply a vertical transform to the block of scaled coefficients; and apply a horizontal transform to block of scaled coefficients (see section 14.3.2.2, wherein a horizontal transform is applied in equation 14-4, and a vertical transform is then applied in equation 14-6).

Regarding **claim 45**, Wiegand discloses a decider comprising:

scaling a block of coefficients that represents a block of information using a scaling factor determined for each coefficient by computing an index for said each coefficient and indexing a look-up table (LUT) using the index (see section 14.3.2.2, wherein equation 14-3 is used to scale an MxN block of coefficients, wherein a coefficient YQ(i,j) is scaled by R(QP%6, i, j), such that for each scaling operation, in order to determine R(QP%6, i, j), index parameters i, j, QP, and block size are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4),

wherein the index is based on a quantization parameter and a position of said each coefficient within the block (see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), QP, block size, and coefficient position i, j are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4);

applying a vertical transform and a horizontal transform to the block of scaled coefficients in order to decode the block of information (see section 14.3.2, wherein as shown in section 14.3.2.2 the matrix of scaled coefficients YD(i,j) are inverse transformed first horizontally and then vertically to obtain a final decoded result S'(I,j));

wherein the LUT is used independently of the block size, such that the LUT supports the transform being for one of a plurality of block sizes (see table 14-1, wherein the same lookup table 14-1 is used regardless of whether mode 8x8, 8x4, 4x8, or 4x4 is used, and further wherein the same S table $S_{8x4,4x8}$ is used within the lookup table 14-1 for both mode 4x8 and mode 8x4).

Wiegand fails to disclose "wherein the basis vectors of the vertical and horizontal transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8,

or multiples thereof

However, the examiner maintains that it would have been obvious, as taught by Ohki, to provide:

wherein the basis vectors of the vertical and horizontal transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8,

or multiples thereof. (see column 7 line 59 through column 8 line 27 and column 9 lines 4-17, wherein an 8x8 near-linear IDCT is disclosed such that, factoring out a multiple of ½, the disclosed inverse transform coefficients are nearly the same as those in the claimed invention. While the examiner concedes that the blocks of coefficients are not identical, the examiner maintains that since both matrices are approximations of an IDCT applied to an 8x8 block of coefficients, one of ordinary skill in the art would recognize that the differences amount to different choices of rounding

from the original irrational numbers and are thus merely a design choice. The examiner will reconsider, if applicant amends the claim to include some advantage over the prior art).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing "wherein the basis vectors of the vertical and horizontal transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8,

or multiples thereof. ", as taught by Ohki, for the purpose of performing an IDCT processing without employing multiplication circuits, resulting in a simpler circuit (see Ohki column 9 lines 4-17).

In addition, Wiegand fails to expressly disclose implementing the above steps using a decoding apparatus comprising the "means for" scaling and the "means for" applying a vertical transform and a horizontal transform. However, the examiner maintains that it would have been obvious, in view of Boon, to provide:

decoding apparatus comprising the "means for" scaling and the "means for" applying a vertical transform and a horizontal transform (see Boon column 29 lines 48-54).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically

providing a decoding apparatus comprising the "means for" scaling and the "means for" applying a vertical transform and a horizontal transform, as taught by Boon, for the purpose of ensuring a high computational speed, the capability of program algorithm modification without changing hardware, and to provide the ability for the decoding algorithm to be disseminated and used by the millions of people who have access to computers.

Response to Arguments

8. Applicant's arguments filed 07/17/2008 have been fully considered but they are not persuasive.

Applicant argues that "claims 1-45 provide a 'useful, concrete, and tangible result', namely applying a transform in order to decode a block of information... the final result is the decoded block of information" (see Applicant's response pages 15-16). The examiner respectfully disagrees. Specifically, the examiner maintains that "decoding the block of information" is still nothing more than the manipulation of data. Decoding information is simply applying a mathematical formula to that information, and thus the applicant has failed to overcome the rejection under 35 U.S.C. §101.

Applicant argues that "Claims 13, 25, 37, and 41 have been amended to embodying the claims in a computer implementation... as such, claims 13, 25, 37, 41, and their respective dependent claims, are directed to statutory subject matter and have overcome the present §101 rejection". The examiner respectfully disagrees. Specifically, while the amendments to claims 25 and 41 now recite the functional

descriptive material being embodied in a computer readable medium (however still rejected based on the §101 rejection discussed in the paragraph above), claims 13 and 37 still recite functional descriptive material **without** being embodied on a computer readable medium. Claims 13 and 37 could still be interpreted as being nothing more than software.

Applicant argues that “Wiegand specifically states that the 'coefficient R(k,i,j) used in the following table [table 14-1] is mode dependent and chosen from the table below.' (Wiegand at §14.3.2.2)… Wiegand continues with defining which portions of the table are used for the various block sizes (modes) utilized in the scaling of SBT transform coefficients… Wiegand makes clear that Table 14-1 is divided into different sections based on which mode (block size) is being utilized)… As such, Wiegand expressly teaches that the LUT is not used independently of the block size and the LUT does not support the transform being for one of a plurality of block sizes”. The examiner respectfully disagrees. Specifically, the examiner maintains that this interpretation of a LUT being used “independently of block size” goes against applicants own claim. Claim 1 lines 3-5 read “computing an index for said each coefficients and indexing a look-up table using the index, wherein the index is based on… ***a size of the block of coefficients***”. Thus, it is clear that a reasonable interpretation of a LUT used independently of the block size indeed requires allowing the index to be dependent on the size of the block of coefficients. Secondly, the examiner maintains that the limitation "wherein the LUT is used independently of the block size, such that the LUT supports the transform being for one a plurality of block sizes” can easily be interpreted to mean

that the same LUT is used regardless of the block size, such that the LUT supports the transform being for one of a plurality of block sizes, as is the case is Wiegand.

As to applicant's arguments of the other claims, they are mere repetitions of the arguments above, and thus the examiner refers applicant to the responses above.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL ZEILBERGER whose telephone number is (571)270-3570. The examiner can normally be reached on M-F 8:30-6pm est (alternate Fridays off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571)272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Daniel Zeilberger
Examiner
Art Unit 2624

DZ
11/10/2008

/Vikkram Bali/
Supervisory Patent Examiner, Art Unit 2624